

Attorney Docket No.: F7752(V)
Serial No.: 10/583,421
Filing Date: June 19, 2006
Confirmation No.: 1710

REMARKS

Election/Restriction

Claims 11-15 have been withdrawn in accordance with an election with traverse made June 3, 2009. Applicants respectfully request rejoinder of all claims because amended claim 1 incorporates a special technical feature which is shared by all the claims.

Amendments to the Claims

Claim 1 was amended without prejudice and new claims 16-18 were introduced to recite preferred embodiments of applicants invention that are more clearly differentiated from the prior art.

Amended claim 1 specifies that the polymer is a covalently cross-linked biopolymer (page 2, lines 17-22) selected from the group consisting of sugar beet pectin (page 6, lines 15-16) having chemically attached feruoylated glycerides (page 10, lines 1-4; page 13, lines 24-25); citosan having covalently coupled vanillin groups (page 6, lines 31-32), and citosan having covalently coupled vanillin groups and chemically attached feruoylated glycerides (page 14, line 10 to page 15, line 16).

New claim 16 restricts the covalently cross-linked biopolymer recited in claim 1 to chitosan having covalently coupled vanillin groups, or chitosan having both covalently coupled vanillin groups and chemically attached feruoylated glycerides.

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Claims 17 and 18 specify that the chitosan having covalently coupled vanillin groups recited in claims 1 and 16 respectively have a weight ratio of chitosan to vanillin of 2:1 to 50:1 as disclosed in Table 3.1 on page 21 of the specification.

Claims 2-5, and 8-10 have been canceled without prejudice.

Claims Rejection under 35 USC §112

Claim 9 and 10 were rejected under 35 USC §112, second paragraph as being indefinite. Since claims 9 and 10 have been canceled, the §112 rejection is moot.

Claim Rejections – 35 USC § 102

Claims 1, 2 and 5-7 were rejected under 35 U.S.C. §102(b) as being anticipated by Konno (EP 0328317 A1). Applicants respectfully request the Examiner's reconsideration in view of the above amendments and following remarks.

Claim 1 is directed to an edible barrier comprising a covalently cross-linked biopolymer selected from the group consisting of sugar beet pectin having chemically attached feruoylated glycerides, chitosan having covalently coupled vanillin groups, and chitosan having covalently coupled vanillin groups and chemically attached feruoylated glycerides; and a lipid material, said edible barrier having a thickness of about 2 to 1,500 micrometer wherein said lipid material is an edible oil, fat or wax.

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Konno discloses edible films which comprise a curdian and a water-soluble macromolecular substance. The films have heat sealability and water solubility and can be used as edible casings for foodstuffs and, when food materials are incorporated in said films, they can be used also as tasting films. (Abstract)

Konno teaches that pectin is suitable as the water-soluble macromolecular substance and that the food stuff can be an oil or fat.

Konno teaches that the curdian component is a thermo-gelable beta -1,3-glucan type polysaccharide and is silent about any polymer that is covalently cross-linked.

Konno is silent about the barrier properties of films. The word "barrier" is not mentioned in the reference.

MPEP 706.02 states that "...for anticipation under 35 U.S.C. 102, the reference must teach every aspect of the claimed invention either explicitly or impliedly. Any feature not directly taught must be inherently present."

Since Konno is silent regarding covalently cross-linked biopolymer, sugar beet pectin having chemically attached feruoylated glycerides, chitosan having covalently coupled vanillin groups, and chitosan having both covalently coupled vanillin groups and chemically attached feruoylated glycerides, the reference can not anticipate applicants' claims.

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Claim Rejections – 35 USC § 103

Claims 3-4 were rejected under 35 USC §103(a) as being unpatentable over Konno (EP 0328317 A1) as applied to claim 1 above and further in view of Fitchett (U.S. patent publication 2002/0028197). Applicants respectfully request the Examiner to reconsider this rejection in light of the above amendments and following remarks.

Although claims 3-4 have been canceled, the issue of non-obviousness of amended claim 1 over the combination of Konno and Fitchett is considered below.

Fitchett discloses "hemicellulose-based gels and viscous media, processes for their production, products containing such gels and/or viscous media and various applications thereof. Improved methods for performing oxidative gelation of hemicelluloses which avoid the need for the addition of hydrogen peroxide are also described". (Abstract)

Fitchett teaches that a suitable polymer is a pectin which incorporates ferulic acid groups, e.g., sugar beet pectin [0011] and that one of the potential applications is a coating or glaze [0075] which the Examiners asserted equates with a barrier or film.

Fitchett is silent regarding sugar beet pectin having chemically attached feruoylated glycerides, chitosan, chitosan having covalently coupled vanillin groups, and chitosan having both covalently coupled vanillin groups and chemically attached feruoylated glycerides.

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To qualify as a 103(a) reference "The prior art reference, or combination of references, must teach or suggest all of the claim limitations (MPEP §2143). In addition to providing at least a suggestion of all the claim limitations, both the suggestion and the reasonable expectation of success must be found in the prior art references, not in Appellant's disclosure" (See *In re Vaeck*, 20 U.S.P.Q.2d 1438, 947 F.2d 448 (Fed Cir. 1991))

Absent a disclosure of covalently cross-linked biopolymer selected from the group consisting of sugar beet pectin having chemically attached feruoylated glycerides, chitosan having covalently coupled vanillin groups, and chitosan having both covalently coupled vanillin groups and chemically attached feruoylated glycerides, the combination of Konno and Fitchett does not present a *prima facie* case of obviousness over amended claim 1.

Claim 8 was rejected under 35 USC §103(a) as being unpatentable over Konno (EP 0328317 A1) in view of Seaborne (U.S. 4,661,359). Applicants respectfully request the Examiner to reconsider this rejection in light of the above amendments and following remarks.

Although claim 8 has been canceled, the issue of non-obviousness of amended claim 1 over the combination of Konno and Seaborne is considered below.

Konno has already been discussed in relation to claim 1.

Seaborne discloses "edible film coating compositions of low moisture permeability and their methods of preparation. The compositions comprise cross-linked, refined shellac and hydroxypropyl cellulose (HPC) in a weight ratio of 1:0.001 to 1:2. Highly preferred compositions additionally comprise mono- or di-carboxylic acid adducts such

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as adipic, succinic, lauric, or stearic acids in a weight ratio of acid to combined weight of shellac and cellulose of 1:33 to 1:10. In the preferred method of preparing, the shellac is cross-linked in a dry, molten mixture with the HPC by heating at 130 DEG to 175 DEG C. for 2 to 15 minutes. The coating compound while molten is dissolved in a food grade solvent, applied to a substrate, and dried. The coating compositions are particularly useful as a moisture barrier in composite food articles having phases in contact which differ substantially in water activity. Effective films range from 0.1 to 5 mils in thickness. (Abstract)

Seaborne, like Konno, is silent regarding sugar beet pectin, sugar beet pectin having chemically attached feruoylated glycerides, chitosan, chitosan having covalently coupled vanillin groups, and chitosan having both covalently coupled vanillin groups and chemically attached feruoylated glycerides. Absent a disclosure of these elements, the combination of Konno and Seaborne does not present a *prima facie* case of obviousness over amended claim 1.

Claim 9 was rejected under 35 USC §103(a) as being unpatentable over Konno (EP 0328317 A1) in view of Fitchett (U.S. patent publication 2002/0028197) and further in view of Seaborne (U.S. 4,661,359) and still further in view of Tharanathan, R.N. (Biodegradable films and composite coatings: past present and future, Trends in Food Science and Technology 14 (2003) pp 71-78) . Applicants respectfully request the Examiner to reconsider this rejection in light of the above amendments and following remarks.

Although claim 9 has been canceled, the issue of non-obviousness of amended claim 1 over the combination of Konno, Fitchett, Seaborne and Tharanathan is considered below.

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Konno, Fitchett and Seaborne have already been discussed.

Tharanathan presents a review article on Biodegradable films and composite coatings used in food packaging. Tharanathan was relied upon for teaching that free fatty acids, cellulose, pectins, and various other elements shown in Fig 1 (reproduced below) are compatible for biodegradable packaging films and coatings.

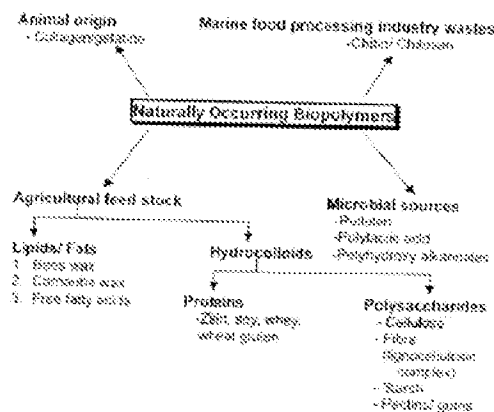


Fig. 1. Naturally occurring biopolymers of use in biodegradable packaging films and composites.

Tharanathan, like Konno, Fritchett and Seaborne, is silent regarding sugar beet pectin having chemically attached feruoylated glycerides, chitosan having covalently coupled vanillin groups, and chitosan having both covalently coupled vanillin groups and chemically attached feruoylated glycerides. Absent a disclosure of these elements, the combination of references does not present a *prima facie* case of obviousness over amended claim 1.

Claim 10 was rejected under 35 USC §103(a) as being unpatentable over Konno (EP 0328317 A1) as applied to claim 1 above and further in view of Beyer

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(U.S. patent publication 2002/0004089 A1). Applicants respectfully request the Examiner to reconsider this rejection in light of the above amendments and following remarks.

Although claim 10 has been canceled, the issue of non-obviousness of amended claim 1 over the combination of Konno and Beyer is considered below.

Beyer discloses a polymer comprising acid casein or a non-toxic soluble salt thereof and high-methoxyl pectin cross-linked into a 3-dimensional network. Also provided is a polymer comprising acid casein or a non-toxic soluble salt thereof and high-methoxyl pectin, wherein the polymer has been prepared by reacting the acid casein or pectin under alkaline conditions. Also provided is a process for preparing the polymer and edible films and food products comprising the polymer. (Abstract)

Beyer, like Konno is silent regarding covalently cross-linked biopolymer selected from the group consisting of sugar beet pectin having chemically attached feruoylated glycerides, chitosan having both covalently coupled vanillin groups, and chitosan having covalently coupled vanillin groups and chemically attached feruoylated glycerides. Absent a disclosure of these elements, the combination of references does not present a *prima facie* case of obviousness over amended claim 1.

In view of the foregoing amendment and remarks, applicants respectfully request that the application be allowed to issue.

If a telephone conversation would be of assistance in advancing prosecution of the subject application, applicants' undersigned agent invites the Examiner to telephone him at the number provided.

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Respectfully submitted,

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